Disruptive Trends in Automotive Software Development

Automotive Line of Business (LoB)

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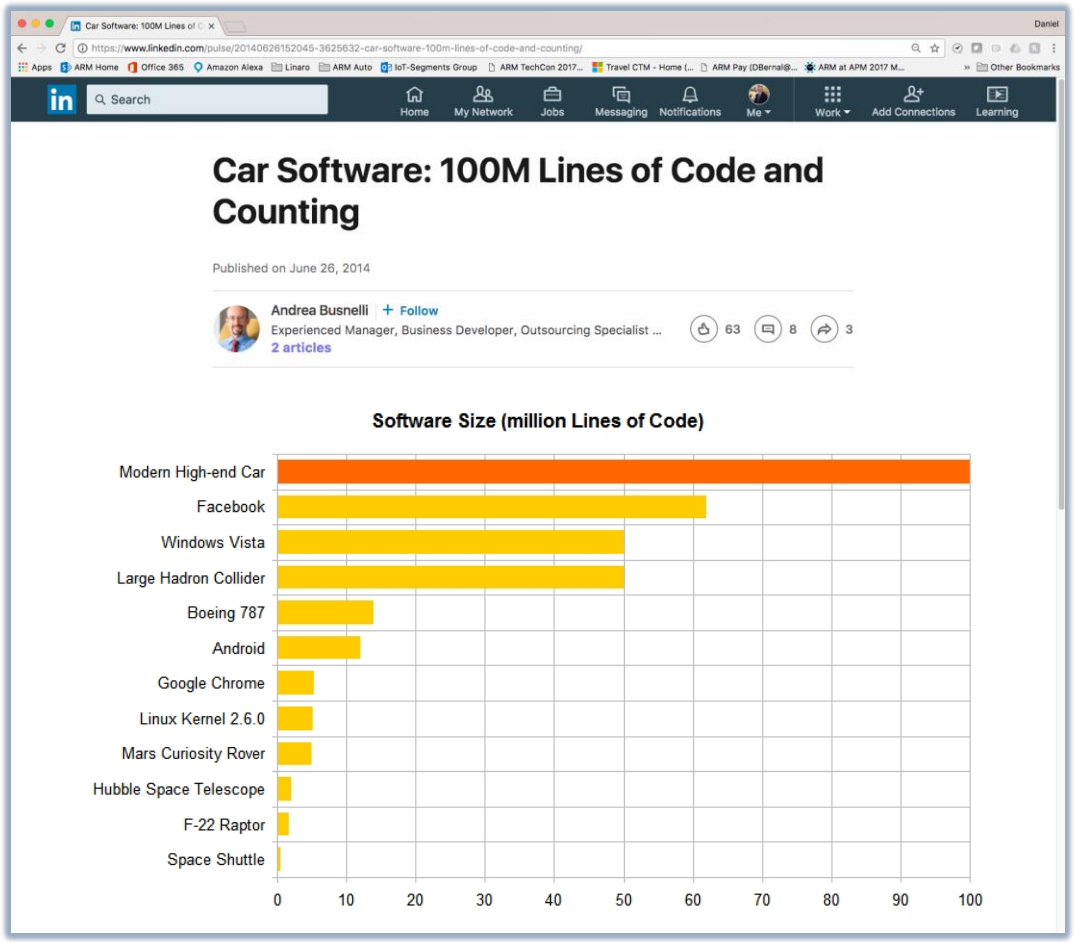
23 Aug 2018

Explosion in SW development by OEMs, Tier 1s

The modern premium vehicle

Over 100 ECUs

Approx. 100M SLOC



Article source:
https://www.linkedin.com/pulse/20140626152045-3625632-car-software-100m-lines-of-code-and-counting/

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Disruption in Automotive Electronics – The Trends

Trends

- Consolidation
- Functional Safety
- Connectivity
- Security
- Over the Air Updates
- Open Source
- Commercial Software
- Long Term Support

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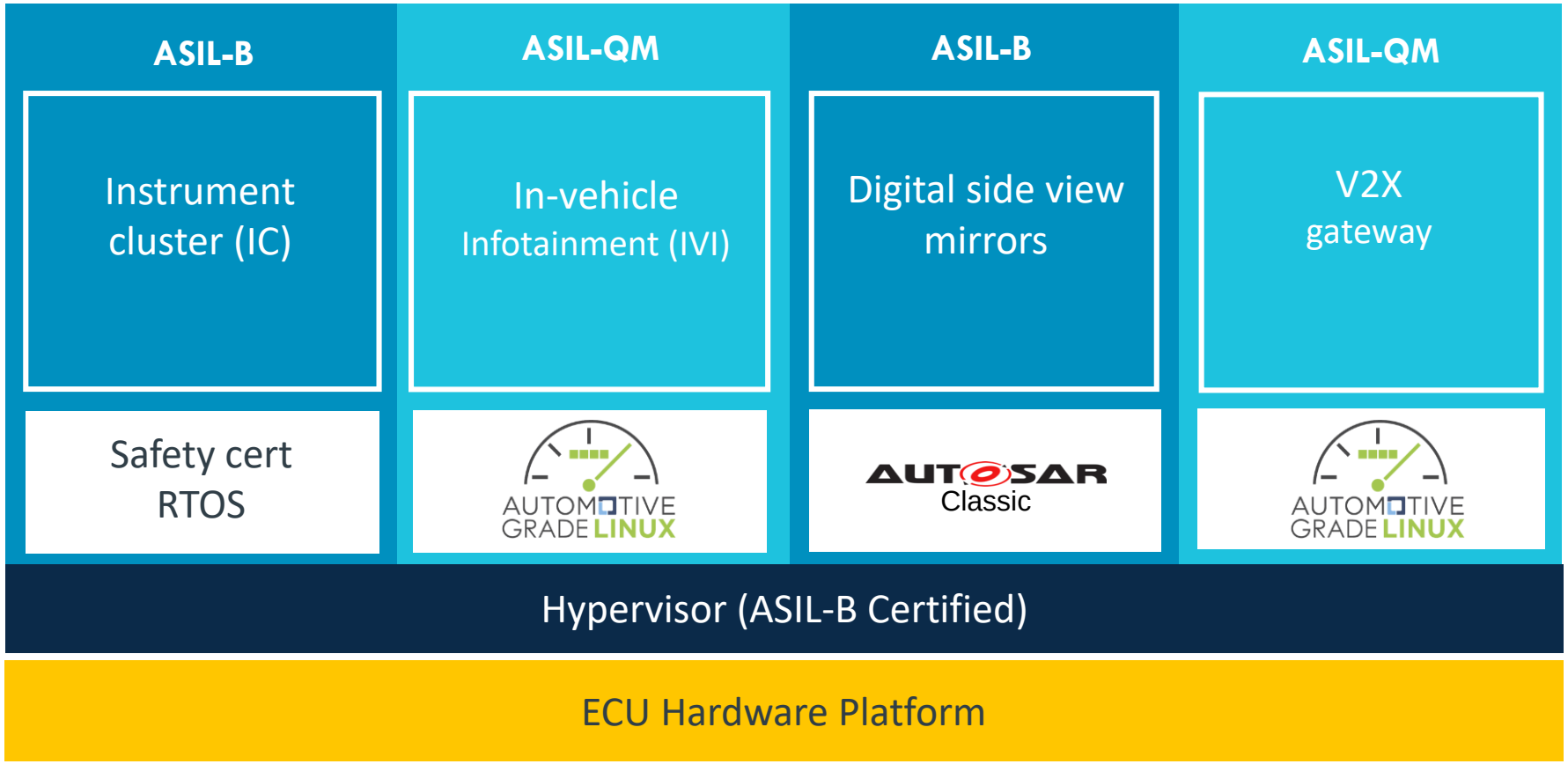
ECU Consolidation – The Trend

- Mixed-Criticality
- Software Defined Architecture
- Leverage Virtualization
- Optimize Connectivity & Wiring



e.g., Cockpit Controller

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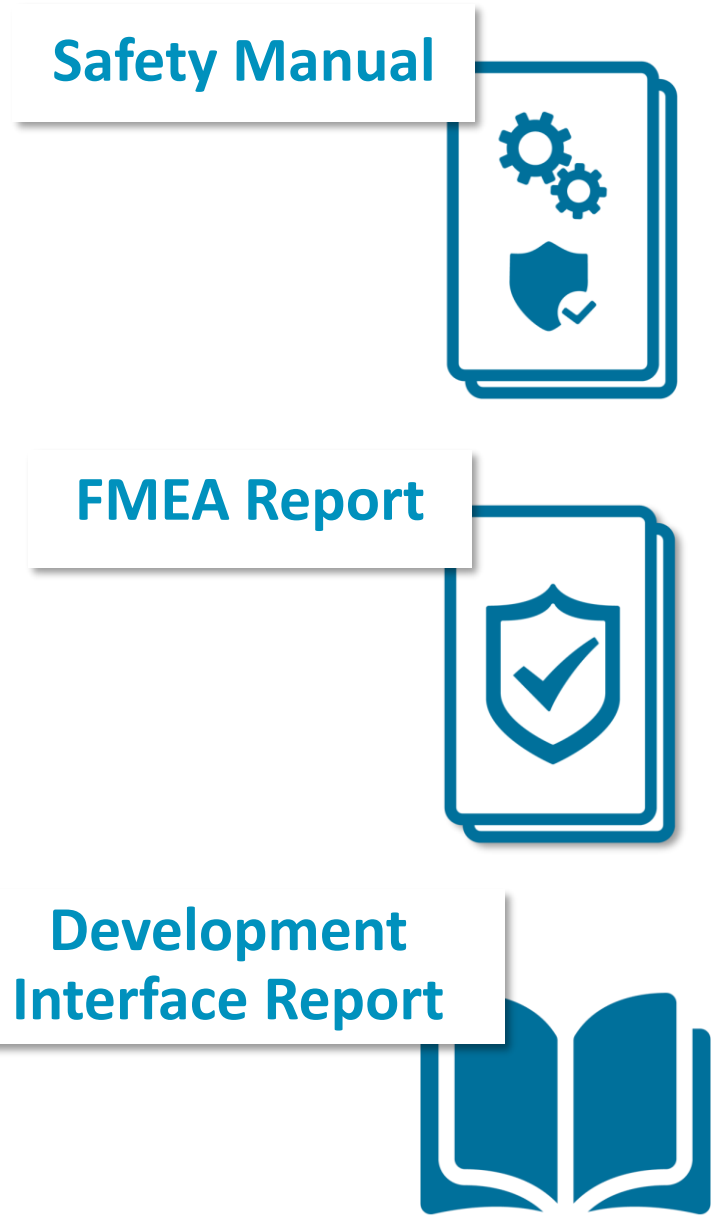
Safety Focus – The Trend

- Fault Detection and Control
- Instrument Cluster – ASIL B
- Digital Mirrors – ASIL B
- ADAS Features – ASIL D
- Autonomous Drive – ASIL B, D
- Arm IP positioned as SEooC



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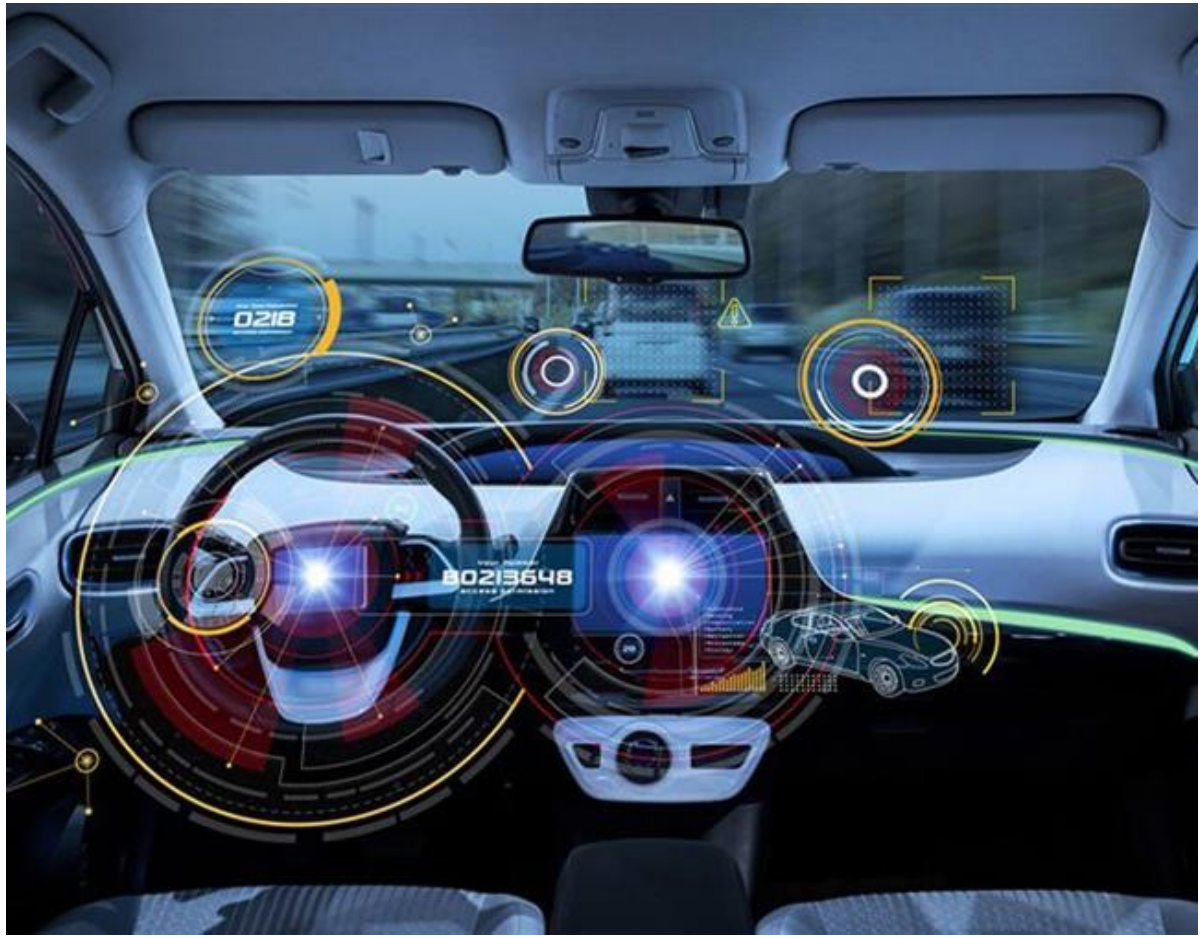
Cabin Connectivity – The Trend

Vehicle Connectivity Requirements

- In-Vehicle Infotainment Services
- Telematics
- V2X Services
- Autonomous Inference Model Updates
- ECU Over the Air Updates



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Security – The Trend

Requirements

- Secure Storage
- HW Root of Trust
- Secure Boot
- Secure KeyGen
- Trusted Execution Environment
- Secure Over The Air Updates
- Standard Framework/ API (PSA)

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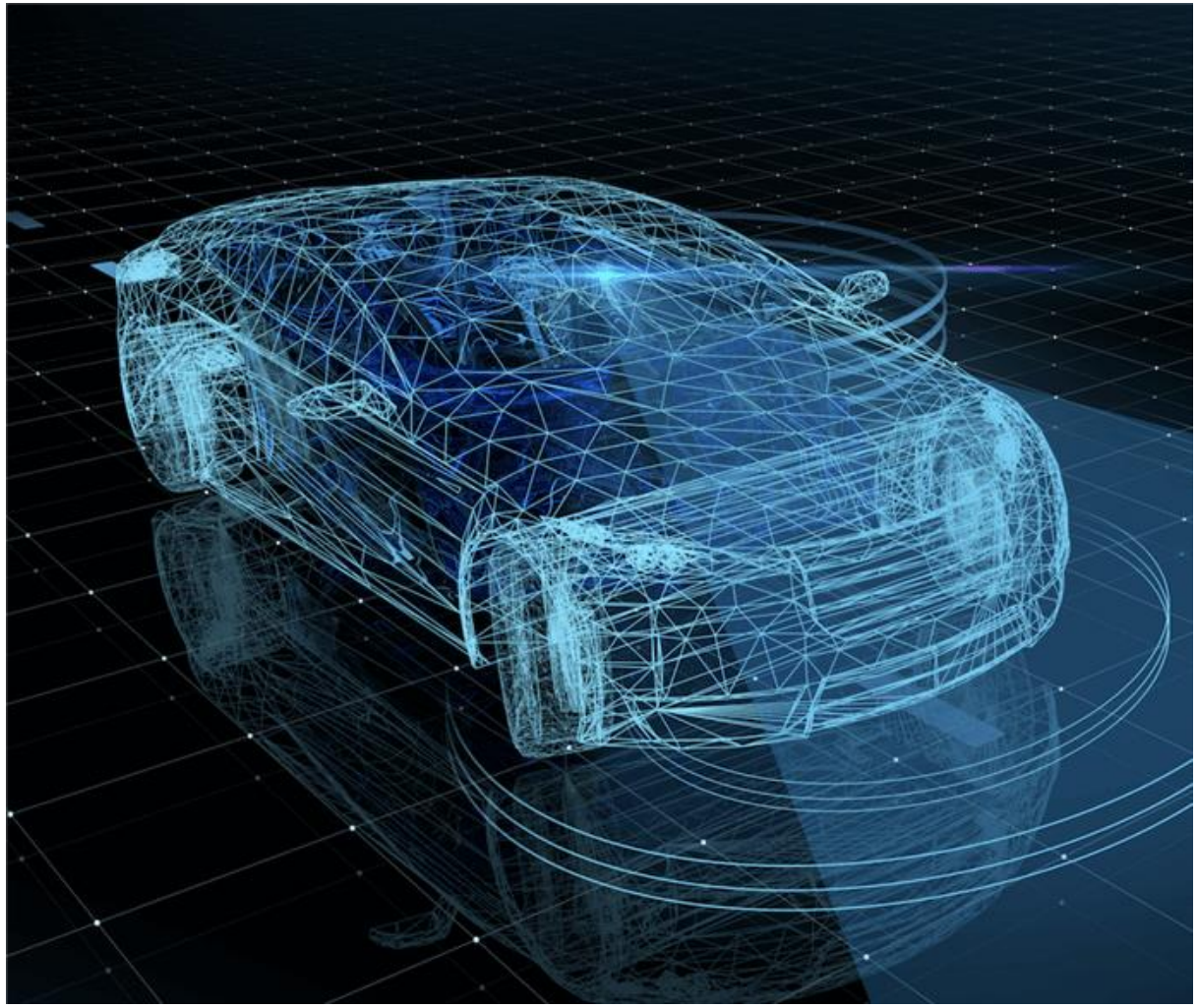
Ubiquitous Software Update – The Trend

Requirements

- Maintain security updates.
- SW update of an ECU relies on security features.
- Device identity and provisioning
- Vehicle architectures have to be considered
- ECU resources drives the capability.



Embracing Open Source – The Trend

Trends

- In-Vehicle Infotainment
- Linux
- Android
- Communication Frameworks
- Arm Trusted Firmware
- Trusted Execution Environment (TEE)

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Leveraging Commercial SW Partners – The Trend

Commercial Software Partners

- Machine Learning Frameworks
- Application Frameworks (e.g., Audio, Video, Communication)
- Security and Safety Frameworks
- Operating System
- Safety Separation (Hypervisor)

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Long Term Support – The Trend

Support Requirements

- 10 – 15 year support
- OTA Software Update

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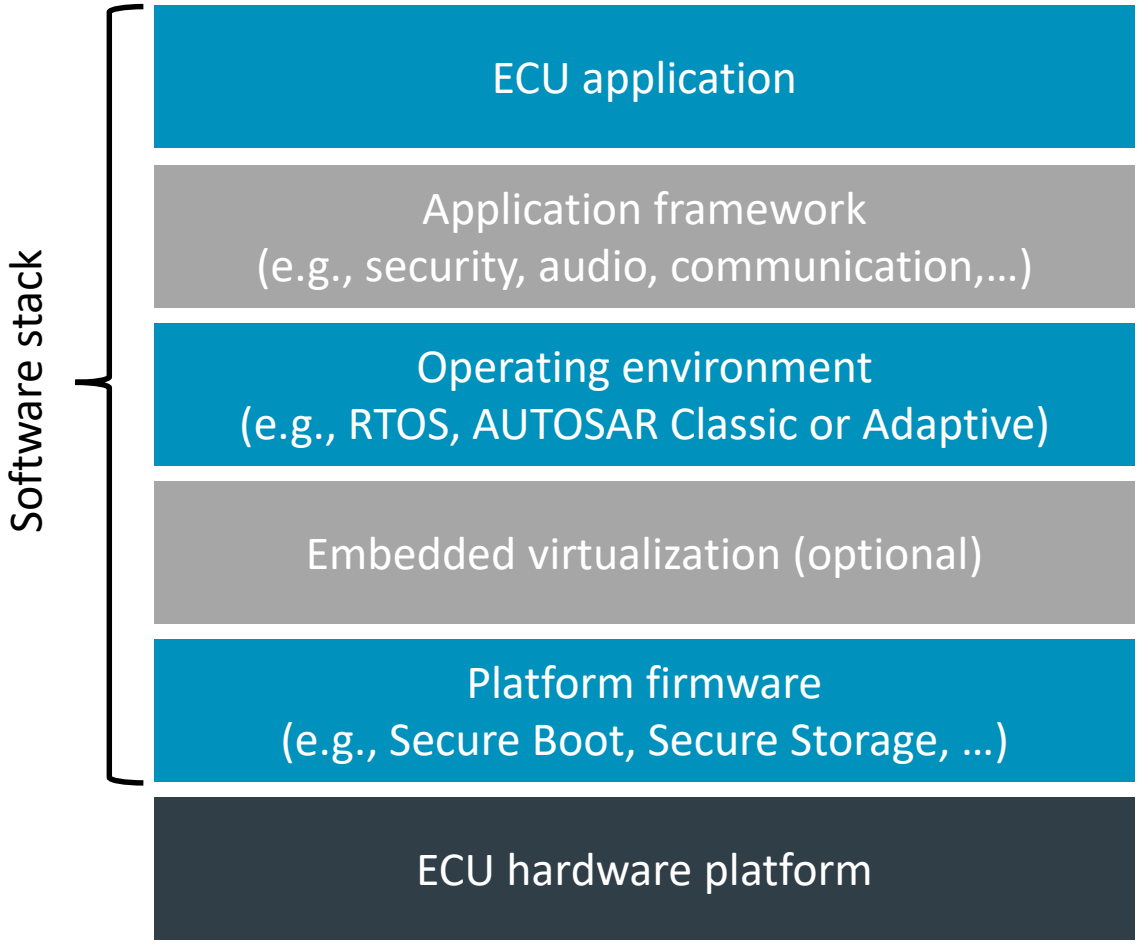
How can the Arm Ecosystem help?

- Risk Reduction
- Reduced Time to Market
- Pre-Certified Software Elements
- Multiple SoC and platform providers.



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SW Stack – Ecosystem of Partners

Category	Solutions		
Machine Learning on Arm	• AiOTA Labs • Arm NN • Brodmann17 • Codeplay	• DeepScale • Enigma Pattern • NALBI Inc. • Pilot AI	• Reality AI • Sensory • SILVIA
Middleware Software and Frameworks	• CoreAVI • Harman/Redbend • Paragon Software	• Recon Technologies (Voice, Audio) • Tuxera	
Security & Safety Frameworks	• Arm STLs • Argus • Escrypt	• Irdeto • Karamba	
Multi-Operating System & Safety Separation Solutions	• Auto Grade Linux • AUTOSAR Classic & Adaptive • Elektrobit • ESOL • ETAS	Elektrobit	• SYSGO • QNX • Vector • Virtual Open Systems
Platform Firmware (e.g., Secure Boot, Secure Storage)	• Arm Trusted Firmware • SIP provided		
Silicon Devices & Board Products	• NXP • Cypress • MediaTek • NVIDIA • Panasonic	• Qualcomm • Renesas • Samsung • Silicon-Mobility • ST Micro	• Telechips • TI • Toshiba • Xilinx

Solutions list is not exhaustive.

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Thank You!